

**WHAT IS CLAIMED IS:**

- 1           1.     An alkaline battery comprising:  
2                 a cathode comprising nickel oxyhydroxide and a gold salt;  
3                 an anode comprising zinc;  
4                 a separator between the anode and the cathode; and  
5                 an alkaline electrolyte.
- 1           2.     The battery of claim 1, wherein the nickel oxyhydroxide includes beta-nickel  
2 oxyhydroxide.
- 1           3.     The battery of claim 1, wherein the nickel oxyhydroxide includes gamma-  
2 nickel oxyhydroxide.
- 1           4.     The battery of claim 1, wherein the nickel oxyhydroxide includes a mixture of  
2 beta-nickel oxyhydroxide and gamma-nickel oxyhydroxide.
- 1           5.     The battery of claim 1, wherein the nickel oxyhydroxide includes unfractured,  
2 substantially spherical particles.
- 1           6.     The battery of claim 5, wherein the gold salt is selected from the group  
2 consisting of gold (+3) oxide, gold (+3) sulfide, gold (+3) hydroxide, and gold (+3) acetate.
- 1           7.     The battery of claim 6, wherein the cathode includes between 5 ppm and 1000  
2 ppm of the gold salt.
- 1           8.     The battery of claim 6, wherein the cathode includes between 10 ppm and 200  
2 ppm of the gold salt.
- 1           9.     The battery of claim 6, wherein the cathode includes between 15 ppm and 100  
2 ppm of the gold salt.

10. The battery of claim 6, wherein the anode includes a gelling agent.

11. The battery of claim 1, wherein the nickel oxyhydroxide is cobalt oxyhydroxide-modified nickel oxyhydroxide.

12. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide has a coating of a cobalt oxyhydroxide on a surface of a nickel oxyhydroxide.

13. The battery of claim 12, wherein the coating is substantially uniform.

14. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide is derived from nickel hydroxide coated with between 2% and 10% cobalt hydroxide by weight.

15. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide is derived from alpha-nickel hydroxide.

16. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide is derived from beta-nickel hydroxide.

17. The battery of claim 11, wherein the gold (+3) salt is selected from the group consisting of gold (+3) oxide, gold (+3) sulfide, gold (+3) hydroxide, and gold (+3) acetate.

18. The battery of claim 17, wherein the anode includes a gelling agent.

19. The battery of claim 1, wherein the nickel oxyhydroxide is derived from alpha-nickel hydroxide.

20. The battery of claim 1, wherein the nickel oxyhydroxide includes a dopant including aluminum, cobalt, manganese or silver.

21. The battery of claim 1, wherein the cathode includes less than about 1,000 ppm of the gold (+3) salt.

1           22.     The battery of claim 1, wherein the cathode includes between 5 ppm and 500  
2 ppm of the gold salt.

1           23.     The battery of claim 1, wherein the cathode includes between 10 ppm and 200  
2 ppm of the gold salt.

1           24.     The battery of claim 1, wherein the cathode includes NaOCl, K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>,  
2 Na<sub>2</sub>S<sub>2</sub>O<sub>8</sub>, KMnO<sub>4</sub>, BaMnO<sub>4</sub>, BaFeO<sub>4</sub>, AgMnO<sub>4</sub>, or AgO.

1           25.     The battery of claim 1, further comprising TeO<sub>2</sub>, CaS, or Bi<sub>2</sub>O<sub>3</sub>.

1           26.     The battery of claim 1, further comprising zinc oxide, calcium fluoride, NiO,  
2 MnO<sub>2</sub>, Zn(OH)<sub>2</sub>, CaO, Ca(OH)<sub>2</sub>, CaSO<sub>4</sub>, MgO, Mg(OH)<sub>2</sub>, MgSO<sub>4</sub>, Ba(OH)<sub>2</sub>, BaSO<sub>4</sub>,  
3 Sr(OH)<sub>2</sub>, Yb<sub>2</sub>O<sub>3</sub>, Y(OH)<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, In<sub>2</sub>O<sub>3</sub>, Sb<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, BaTiO<sub>3</sub>, CaTiO<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Sm<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>,  
4 CdO, Ag<sub>2</sub>O, BaO, CaWO<sub>4</sub>, CaSi<sub>2</sub>O<sub>5</sub>, or SrTiO<sub>3</sub>.

1           27.     The battery of claim 1, wherein the battery is a primary battery.

1           28.     The battery of claim 27, further comprising a thulium salt.

1           29.     The battery of claim 28, wherein the thulium salt includes thulium (3+) oxide  
2 or thulium (3+) sulfate.

1           30.     The battery of claim 27, wherein the capacity loss is less than 40% after  
2 storing the battery at 60°C for 4 weeks.

1           31.     The battery of claim 27, wherein the capacity loss is less than 30% after  
2 storing the battery at 60°C for 4 weeks.

1           32.     The battery of claim 27, wherein the capacity loss is less than 10% after  
2 storing the battery at 60°C for 4 weeks.

1           33.     The battery of claim 1, wherein the cathode includes a conductive carbon.

1           34.    A primary alkaline battery comprising:  
2                   a cathode comprising nickel oxyhydroxide and a gold salt selected from the  
3                   group consisting of gold (+3) oxide, gold (+3) sulfide, gold (+3) hydroxide,  
4                   and gold (+3) acetate;  
5                   an anode comprising zinc;  
6                   a separator between the anode and the cathode; and  
7                   an alkaline electrolyte.

1           35.    The battery of claim 34, wherein the nickel oxyhydroxide includes beta-nickel  
2 oxyhydroxide.

1           36.    The battery of claim 34, wherein the nickel oxyhydroxide includes gamma-  
2 nickel oxyhydroxide.

1           37.    The battery of claim 34, wherein the nickel oxyhydroxide includes a mixture  
2 of beta-nickel oxyhydroxide and gamma-nickel oxyhydroxide.

1           38.    The battery of claim 34, wherein the nickel oxyhydroxide includes  
2 unfractured, substantially spherical particles.

1           39.    The battery of claim 34, wherein the cathode includes between 5 ppm and 500  
2 ppm of the gold salt.

1           40.    A method of manufacturing an alkaline battery, comprising:  
2                   obtaining a cathode mixture comprising nickel oxyhydroxide, a gold salt, and  
3                   an alkaline electrolyte; and  
4                   assembling a cathode containing the cathode mixture, an anode comprising  
5                   zinc, and a separator between the cathode and the anode to form the alkaline battery.

1           41.    The method of claim 40, further comprising mixing an aqueous alkaline  
2 solution containing the alkaline electrolyte and a gold salt with nickel oxyhydroxide to form  
3 the cathode mixture.

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